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ABSTRACT

This publication is the result of the Texas Parks and Wildlife Division's (TPWD's) commitment to education and the fertile partnerships formed between TPWD biologists and educators. This activity book brings together the expertise and practical knowledge of a classroom teacher with the technical knowledge and skills of a TPWD biologist and artist. Students read stories of animals and plants that are considered endangered. Animals include the black-footed ferret, the red-cockaded woodpecker, the peregrine falcon, the greater long-nosed bat, the golden-cheeked warbler, the black-capped vireo, the ocelot, the whooping crane, and the Houston toad. (CCM)

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Texas Endangered Species Activity Book

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by
Kathleen Marie Jackson
and
Linda Campbell

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The Texas Endangered Species Activity Book is the result of Texas Parks and Wildlife's (TPWD) commitment to education and the fertile partnerships formed between TPWD biologists and educators. Developed by Kathy Jackson, a teacher at Barton Creek Elementary in Eanes ISD, the activity book brings together the expertise and practical knowledge of a classroom teacher with the technical knowledge and skills of TPWD biologists and artists. Both Kathy Jackson and artist Phuong Nguyen were employed by TPWD under the summer intern programs for teachers and students. We hope kids learn from the book, have fun with the activities, and develop an appreciation for the unique plants and animals of Texas.

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Texas Endangered Species Activity Book

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The Black-footed Ferret is **EXTIRPATED** (no longer exists) in Texas!

Do we want any remaining animals or plants to become extirpated also?

This book is devoted to animals and plants that are **ENDANGERED** (in *danger* of becoming extinct).

Enjoy the stories of each animal and plant and when you read about the Black-footed Ferret – remember this animal used to live in West Texas but doesn't anymore.

Someday you will be making decisions that affect the natural resources of Texas. We hope that you will appreciate the plants and animals of our state and understand more about how human activities impact the environment.

2

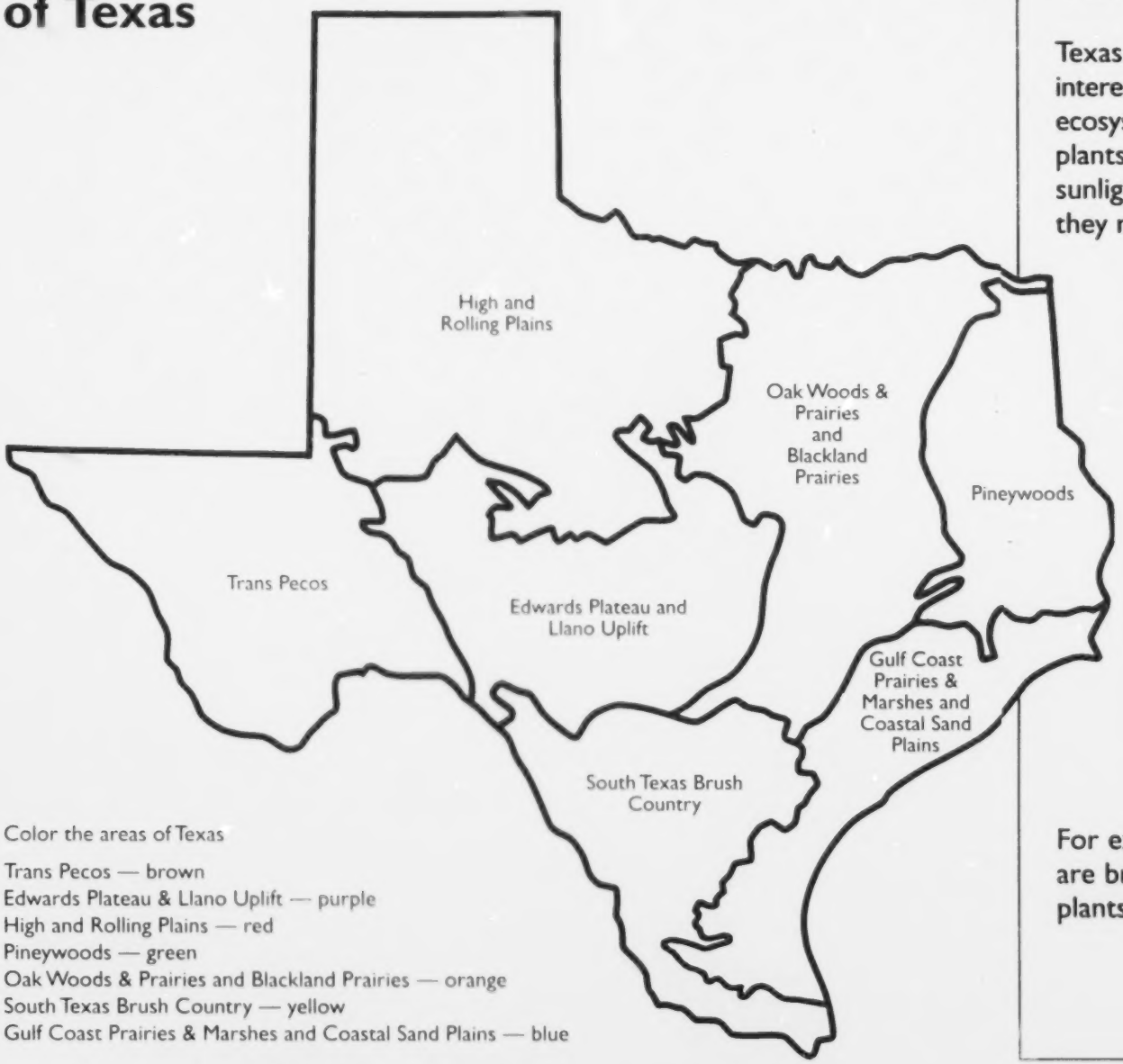
There are animals and plants that are in trouble!

Why should we care?

I remember seeing Attwater's Prairie Chickens around here when I was a child. They are really a neat bird, especially the way they dance at their breeding grounds. I want to show them to my daughter. Where can I see some?
I'm sorry. There are no more Attwater's Prairie Chickens. Maybe you could find a picture of one in a book.
It's not the same! I really wanted to see them on the prairie like my dad did. I wish we could have left some room for the Attwater's Prairie Chicken.

There are less than 100 Attwater's Prairie Chickens left in Texas. Do you think this story could happen one day? We hope not.

Regions of Texas


High and Rolling Plains
Oak Woods & Prairies and Blackland Prairies
Pineywoods
Trans Pecos
Edwards Plateau and Llano Uplift
Gulf Coast Prairies & Marshes and Coastal Sand Plains
South Texas Brush Country

Color the areas of Texas

Trans Pecos — brown
Edwards Plateau & Llano Uplift — purple
High and Rolling Plains — red
Pineywoods — green
Oak Woods & Prairies and Blackland Prairies — orange
South Texas Brush Country — yellow
Gulf Coast Prairies & Marshes and Coastal Sand Plains — blue

Texas Is Special

Texas is a big state with many interesting ecosystems. An ecosystem is a collection of plants and animals along with the sunlight, soil, air and water that they need to live.

An ecosystem may be as small as a pond or fallen log or as large as our earth, which is really an ecosystem in space.

When something threatens the survival of a plant or animal in an ecosystem, a chain reaction can begin. Since plants and animals depend on each other to live, the loss of one kind of animal or plant (species) can affect many others.

For example, when food chains are broken, MANY animals and plants can be affected.

The Black-footed Ferret was listed as endangered in 1967.

Ferrets live in the burrows made by prairie dogs. Prairie dogs are the main food source for ferrets. **In Texas**, the prairie dog population became smaller in number because of changes on the land. As the prairie dog towns disappeared, so did the Black-footed Ferret.

Historical range (shaded) and last known current range (•) of the Black-footed Ferret.

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Black-footed Ferret ...A True Story

A ferret female and her young need at least **100 acres** of prairie dog burrows!

The prairie dog communities have declined and are now separated by areas of farmland. This separation caused problems for the ferrets.

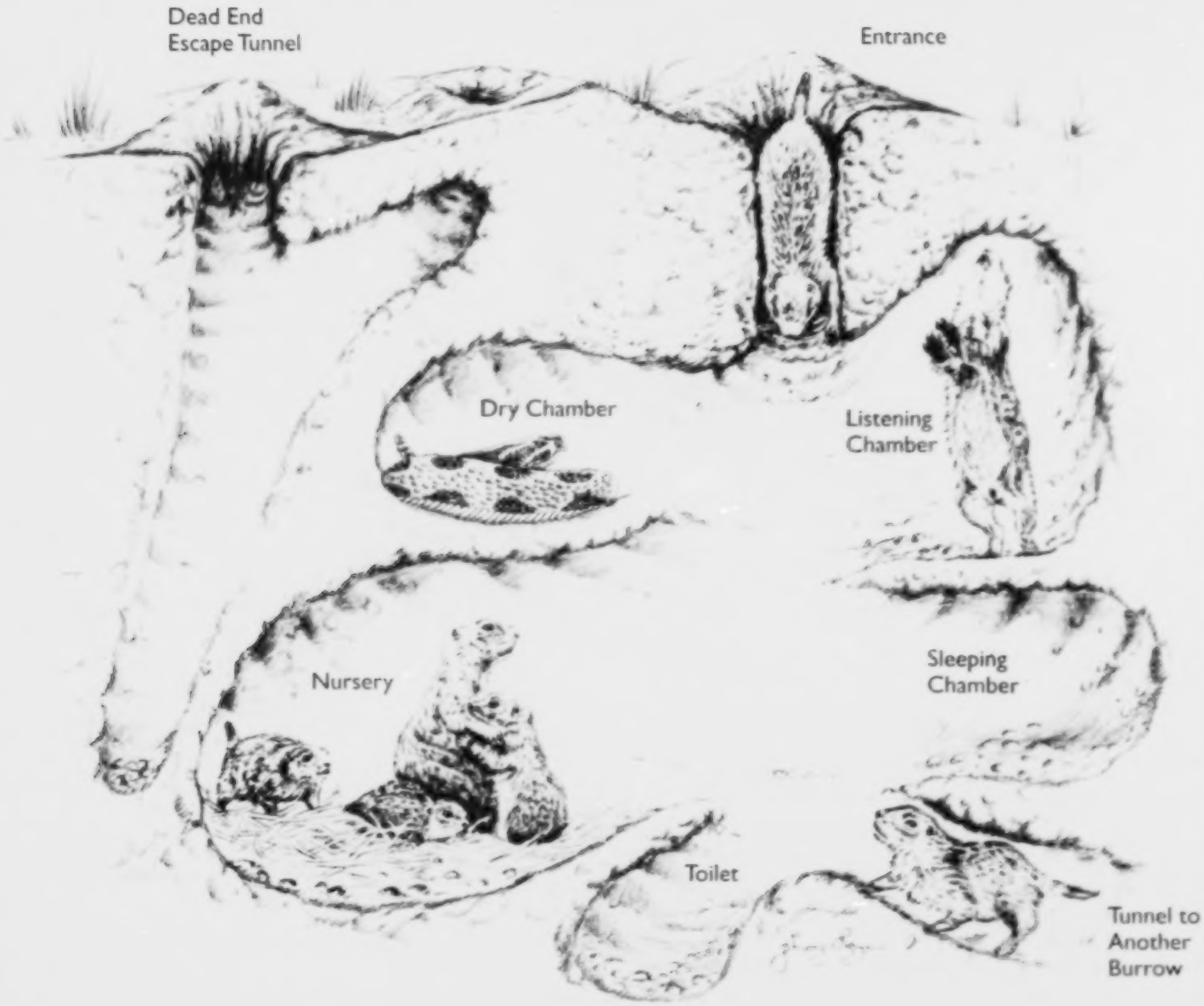
If prairie dog communities are too far apart, young ferrets searching for a home can be eaten by owls, eagles, hawks, coyotes, foxes and bobcats.

Black-footed Ferrets and prairie dogs are an example of animal communities that are part of an ecosystem. If one population declines then it affects the population of another animal or plant in the ecosystem.

How do you think the decline of prairie dog towns affected the Black-footed Ferret?

How did the ferrets get enough food?

How did they protect their young?



Example of a Prairie Dog Town

5

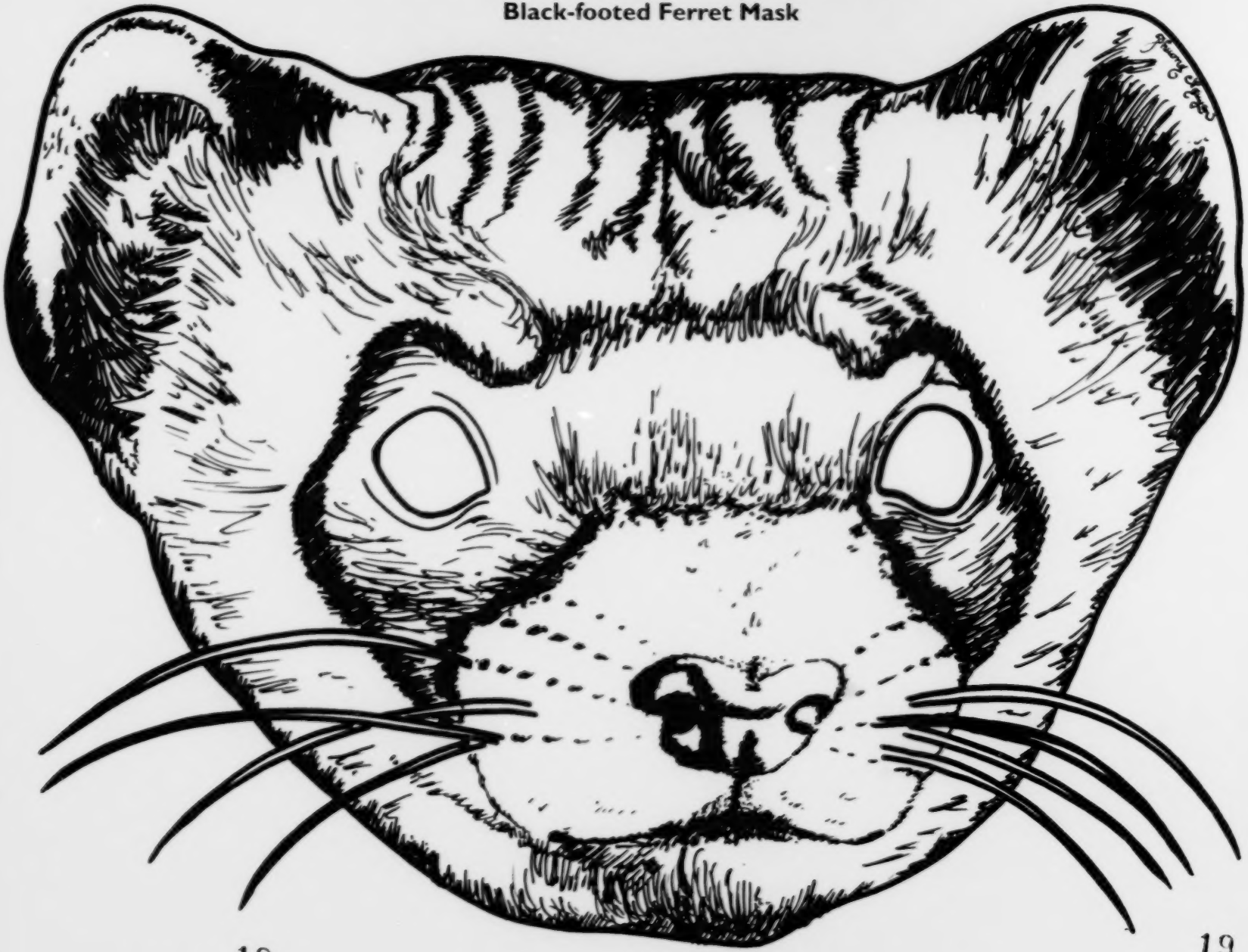
The ferret is tan with a black face "mask" and a dark "saddle" on its back. It has black feet and legs and a black-tipped tail.

Black-footed ferret and prairie dog masks

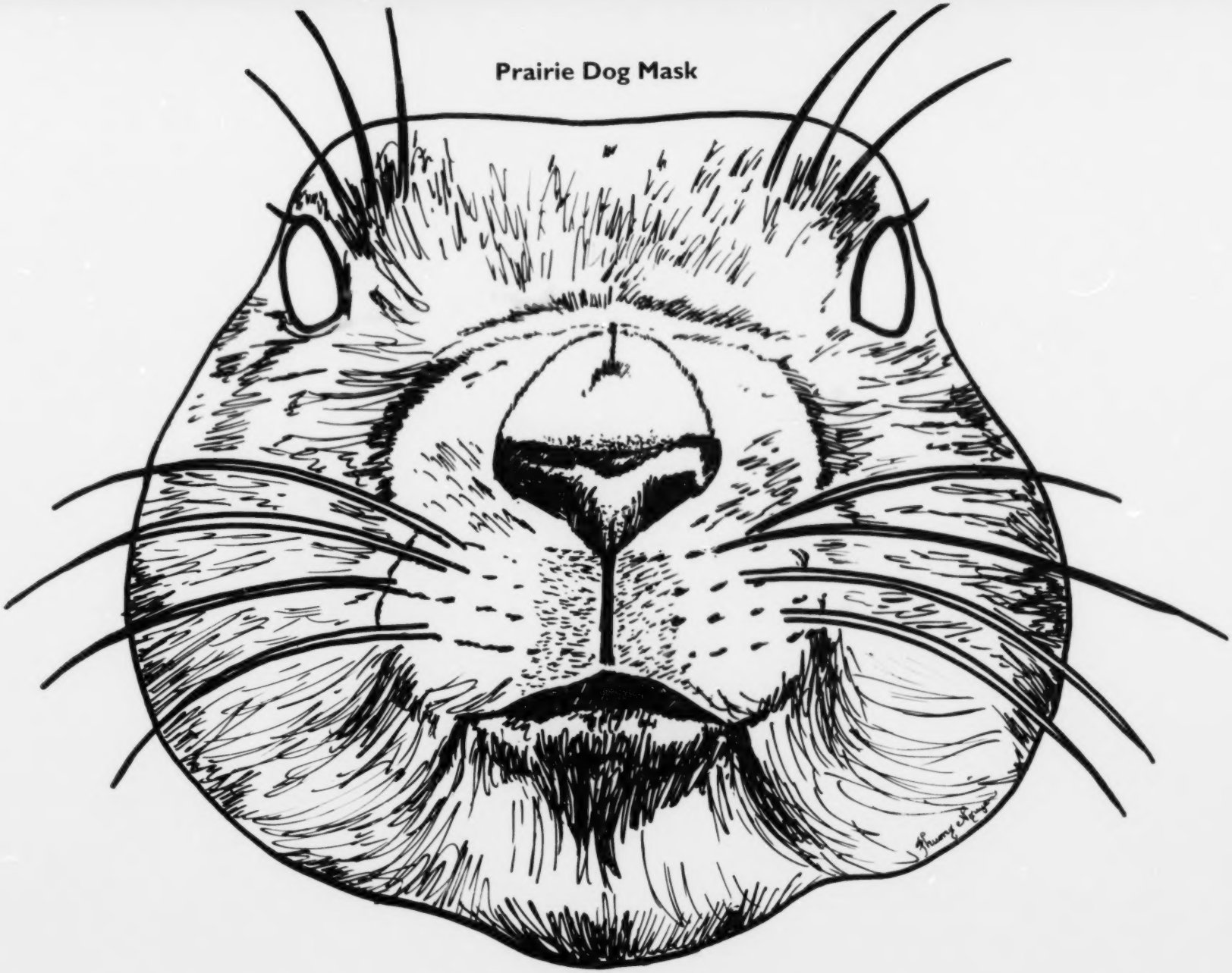
1. Color and cut out the masks in this section and become a Black-footed Ferret or a Prairie Dog for a "partner talk"!
2. After you have cut out and colored your masks, you can hold them up to your face with your hands. (You could also tape a straw, pencil, or popsicle stick to the bottom of the mask to use as a grip.)
3. After your mask is on, you are ready for your "partner talk."
   Ideas for your "partner talk":
   a. Discuss the loss of your animal community.
   b. How did if affect you?
   c. What can people do to fix your problem?

Prairie dogs in Texas have a black-tipped tail and are yellowish brown in color.

Black-footed Ferret Mask



Prairie Dog Mask



Draw your own prairie dog town — be sure to add a Black-footed Ferret in a burrow.

The Red-cockaded Woodpecker and the Texas Trailing Phlox ...A True Story

This is what the Pineywoods looked like long ago when the Native Americans lived here. The spaces you see between the pine trees are important in providing habitat for the Red-cockaded Woodpecker and Texas Trailing Phlox. When the brush between the trees grows thick and/or tall, the Texas Trailing Phlox cannot grow and the Woodpecker cannot easily fly to its cavity home in an old pine tree.

The Texas Trailing Phlox is an endangered plant that shares the Red-cockaded Woodpecker's habitat.

Color cues: Rose, pink, or lavender petals with a purple center.

The main threat to the Red-cockaded Woodpecker has been the decrease in large, old pine trees in the East Texas forest Many of these old trees have been cut down to be used as timber for our society.

The Red-cockaded Woodpecker is the only species that tunnels into a living pine tree, using the cavity for its shelter. These Woodpeckers build their cavities in old pine trees. They prefer trees that are 60-70 years old or even older.

Old pine trees sometimes get a fungus inside their trunk that softens the wood and makes the digging easier for the Woodpeckers. Red-cockaded Woodpeckers eat insects they find on the trunk and branches of pine trees. A group of woodpeckers may need a hundred acres or more in order to find enough food to eat.

In the Pineywoods, when the wilderness was still undeveloped by people, fires would naturally sweep through an area.

All the plants would die except the Longleaf pines. These pines were able to live through a fire.

WOW!

Now people have stopped fires and this has changed the Pineywoods. The brush that used to burn has grown thick and tall in those important open spaces that the Red-cockaded Woodpecker and the Texas trailing phlox need for their habitat.

Is this a problem?

Woodpecker Cavity

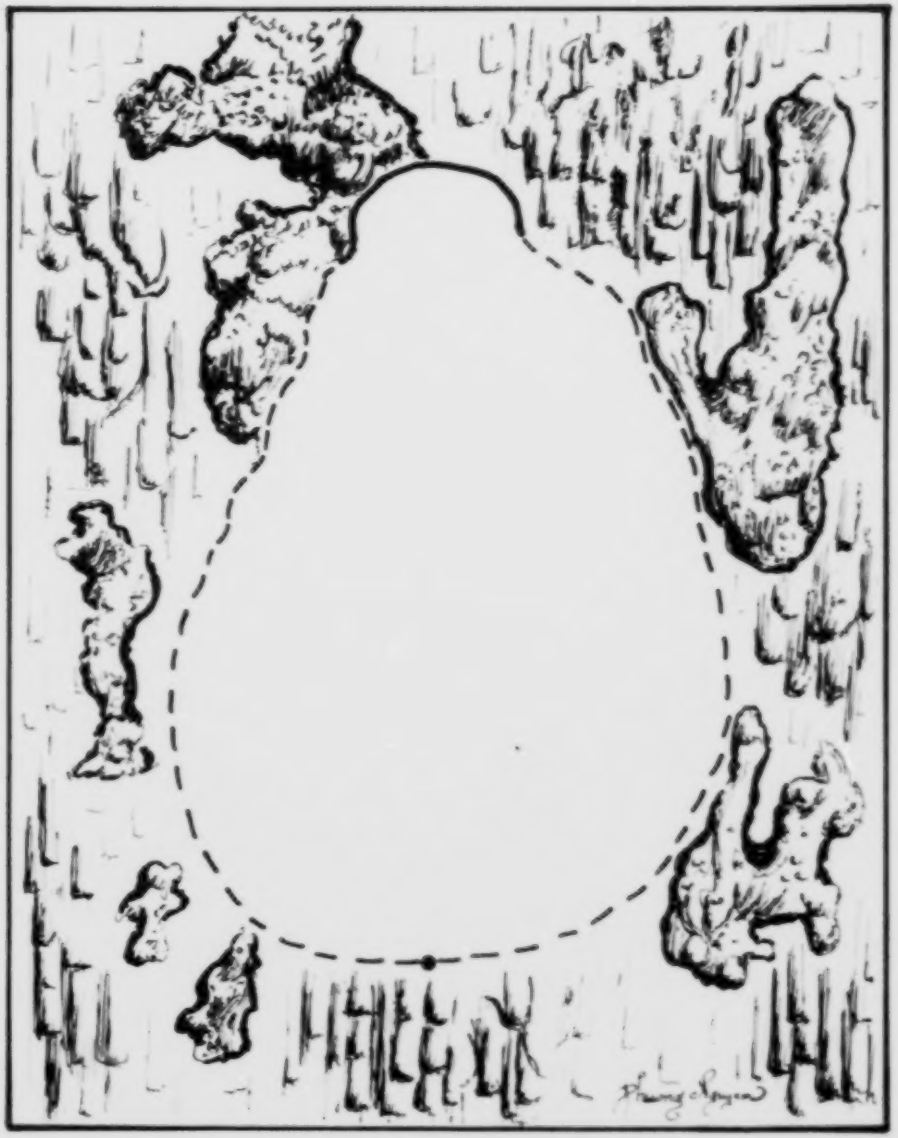
Did you know?

Resin is the sticky sap that drips down the bark when the Woodpecker pecks at the tree to create its cavity. The sticky sap helps protect the cavity from predators such as snakes.

This is a close up of a Woodpecker cavity in an old pine tree. Scientists look for resin when identifying Red-cockaded Woodpecker cavities.

Vocabulary Check: What is resin?

Red-cockaded Woodpecker "Cavity Peek" - Part I



The Resin is light tan and the area around the cavity that had been pecked by the Woodpecker is a reddish brown color.

"Cavity Peek"

Background Information: The Red-cockaded Woodpecker pecks at the bark of a pine tree until the "resin" (sticky substance like syrup) drips down the bark. Some scientists think the Woodpecker does this to protect its cavity from predators like snakes. The snakes get the resin stuck in their scales, so that they can't crawl and they fall off the pine tree.

1. Color and decorate the bark of the tree.
   - *Remember to color the "resin" dripping down the bark. (It looks like candle wax dripping down the outside of a candle.)*
2. Cut the dotted lines around the outside of the circle of page one. Be sure not to cut the dark line.
   - *Stop on each side when the dotted line stops. You might want to push the point of your scissors into the dot at the bottom of the circle as a starting point.*
3. Cut out the rectangle that shows the tree and cavity hole and glue it to the rectangle on the next page. You should be able to "look and see" a Red-cockaded Woodpecker in his cavity.

Red-cockaded Woodpecker "Cavity Peek" - Part 2

This Woodpecker has a solid black cap and a large white patch behind the eye. The male has a tiny red streak at the back of the head (the cockade). It has a black back with white strips and a white breast with black streaks.

Color the Red-cockaded Woodpecker. Use the color cues.

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The Peregrine Falcon ...A True Story

An incredible hunter —

The Peregrine Falcon is a bird of prey. It lives by hunting other birds. The Falcon preys on small birds like swallows, jays, and blackbirds. When hunting, the Peregrine rises to great heights, then goes into a steep power dive called "the stoop." The speed of the dive has been measured at 180 miles per hour (race car driving speed). Falcons strike their prey at such great speed that the prey is often killed instantly just by the blow from the Falcon's talons (claws).

Peregrines are excellent flyers! They can fly at a speed in excess of 60 miles per hour. (As fast as you drive on the highway.) You can recognize this falcon in flight by looking for their "black helmet."

As you've learned from your science classes, pesticides on the ground enter the *food chain*. So when the Falcon eats its dinner, he may be eating pesticide that is in the fatty tissue of an animal that probably ate some plants or seeds covered with a chemical substance such as DDT (a pesticide used to kill insects).

Plants, soil and water contaminated with DDT → Seeds → Blackbird → Falcon

Although eating contaminated food sometimes causes death, usually it affects birds by making them unable to lay normal eggs.

Falcons contaminated with DDT produce eggs with shells so thin that they break when the birds sit on them during nesting. Falcons nest in high places like mountain ledges and cliffs.

The Falcon is bluish gray with a black head (like a helmet). The beak is grayish blue. The throat and underparts of the bird are white or light tan and scattered with black streaks. The ends of the tail feathers are tipped in light yellow-brown. The legs and feet are yellow and the talons (claws) are bluish black.

The Peregrine Falcon has not only faced the threats of habitat loss and human disturbance, it was also a victim of the widespread use of DDT (a pesticide).

DDT was banned in the U.S. in 1972. In 1975 only about 324 pairs of breeding falcons remained in North America.

Today, due to the help and protection that people have offered and the decrease of DDT in the food chain, Peregrine Falcons are reproducing well throughout most of North America. However, in Texas recovery has been slow.

You can do your part by following label directions on how to properly use and dispose of chemicals and their containers. This effort will help to keep harmful chemicals out of the food chain.

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In Texas, we need to protect breeding habitat in the western part of the state.

Since human disturbance can be a serious threat to the falcon, parks such as Big Bend National Park have visitation rules during nesting season.

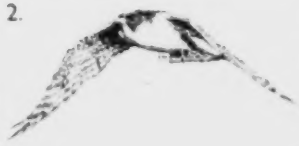
Draw your own food chain for another bird of prey. *Use a fish, a Bald Eagle, a leaf, an insect.*

A Falcon Story Frame

Test your comprehension by filling in the story frame. You may have to go back and reread the information about the falcon.

1. I have a black helmet and I am a great flyer!

I am called a _____

2. 

I am a bird of prey. I eat...

_____

_____

_____

Draw an example of falcon prey here!

3. _____ is a chemical that entered the food chain.

Draw a falcon food chain.

4. This chemical caused me to break my own eggs, the shells were so

_____.

5. Write your favorite falcon facts here!

_____

_____

_____

_____

_____

Dear Friends,

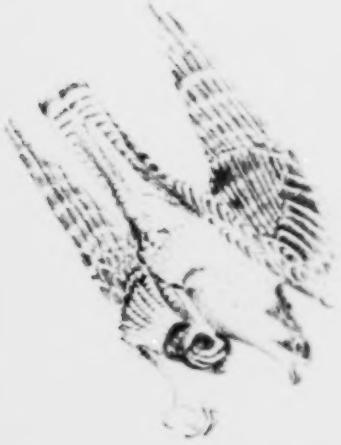
Thanks so much for reading my story! I'm pretty unique aren't I?

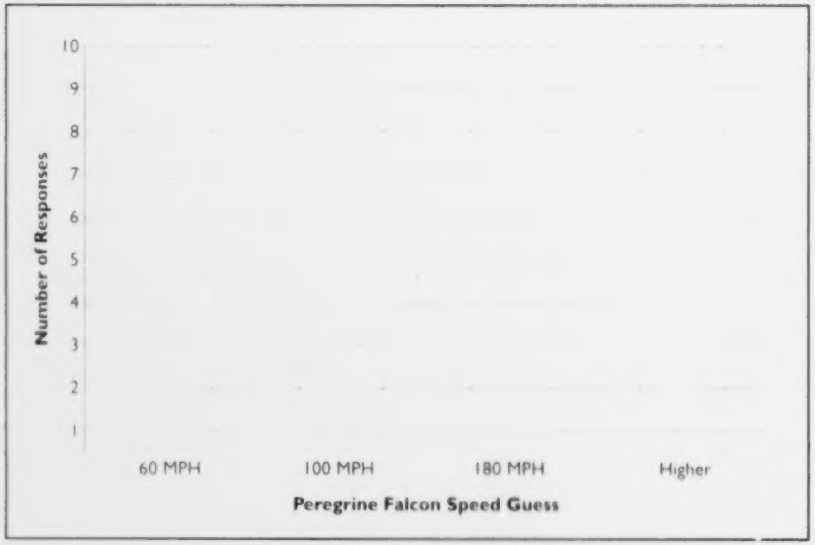
Sincerely,
Perry
Peregrine

Graphing Poll

Now that you have read the material about the falcon, test the trivia level of friends and family.

Participants	Speed 60 MPH	Speed 100 MPH	Speed 180 MPH	Higher Speed
1.				
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				





Take a trivia poll - ask ten people you know if they can guess the right speed of a falcon "stoop."

Step 1. Use the form to record your interview results. Shade in a box for each chosen speed.

Step 2. Be sure to explain to the participants what a "stoop" is.

Step 3. After you have interviewed the participants and asked them to guess the speed of a falcon's dive, record your information on the graph.

You may need an adult to help you create a bar graph.

Example of bar graph

The Greater Long-nosed Bat ...A True Story

The only known Texas roosting site of this bat is in a cave in the mountains of Big Bend National Park. Scientists are not quite sure why the bats are rare. One reason might be that since the bats are nectar feeders, it is hard for them to find enough blooming agave plants for large numbers of bats to eat. Agaves are being harvested by people. Also, large numbers of bats roosting together are sometimes disturbed or even killed by people who mistakenly fear them.

22

These bats spend the summer in Texas and the rest of the year in Mexico. They roost together in large groups called colonies. The bats leave the cave at night to feed on the bright blooming agave plants.

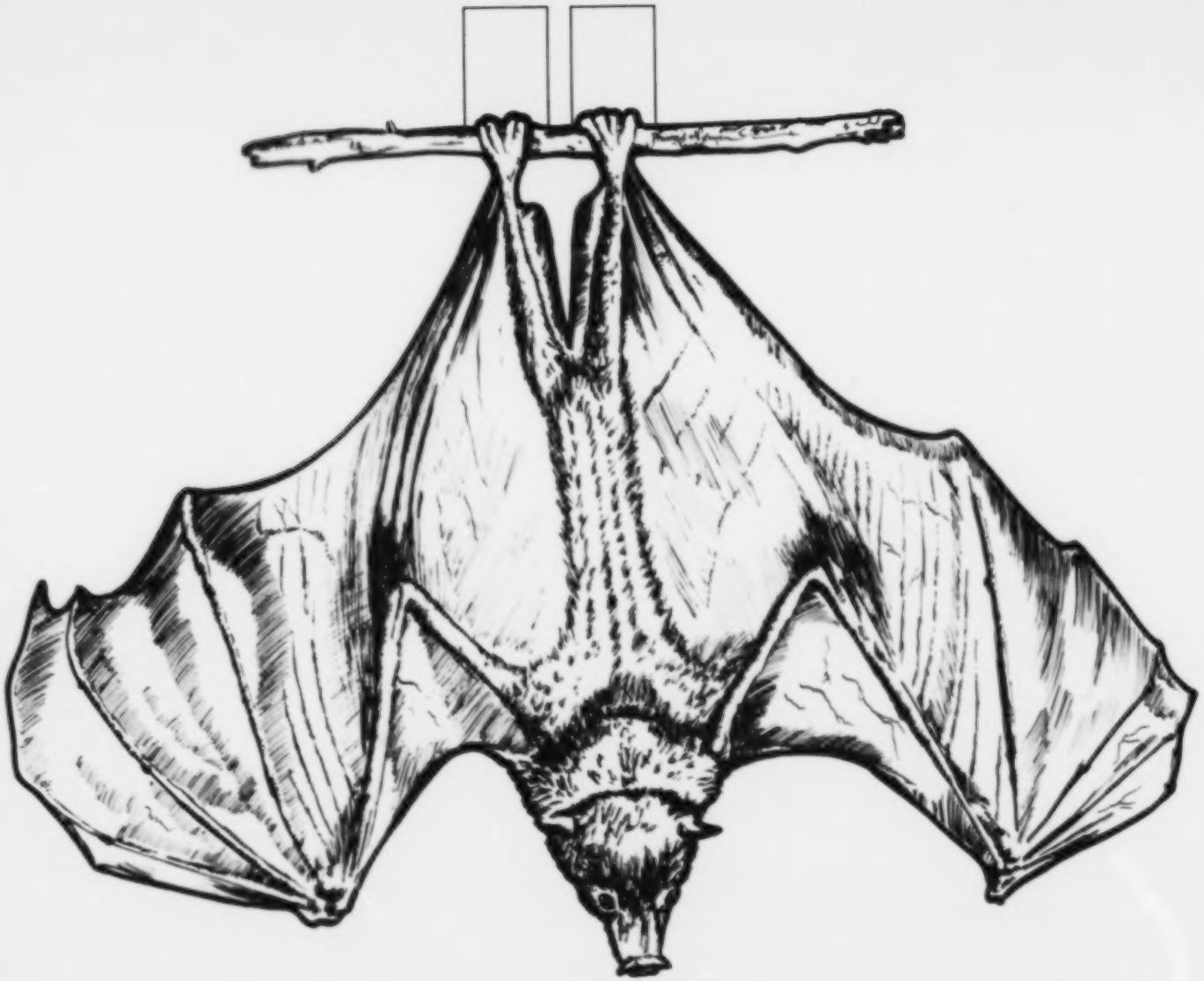
© Merlin D Tuttle

© Merlin D Tuttle

The Greater Long-nosed Bat is special because it has a long nose with a very long tongue. This adaptation (special design) allows the bat to place its tongue into a flower to feed on the nectar (sugar and water) and pollen.

What other animal has a long beak and feeds on flower nectar?

Hint: a bird.



Color and cut out the hanging bat! Cut around the tabs and fold onto a shelf, window, or door sill. Be creative — you might want to draw a cave.

23

Color cues: This bat is dark gray in color.

Glue top pieces across this line.

Lift to view the anatomy of a bat.

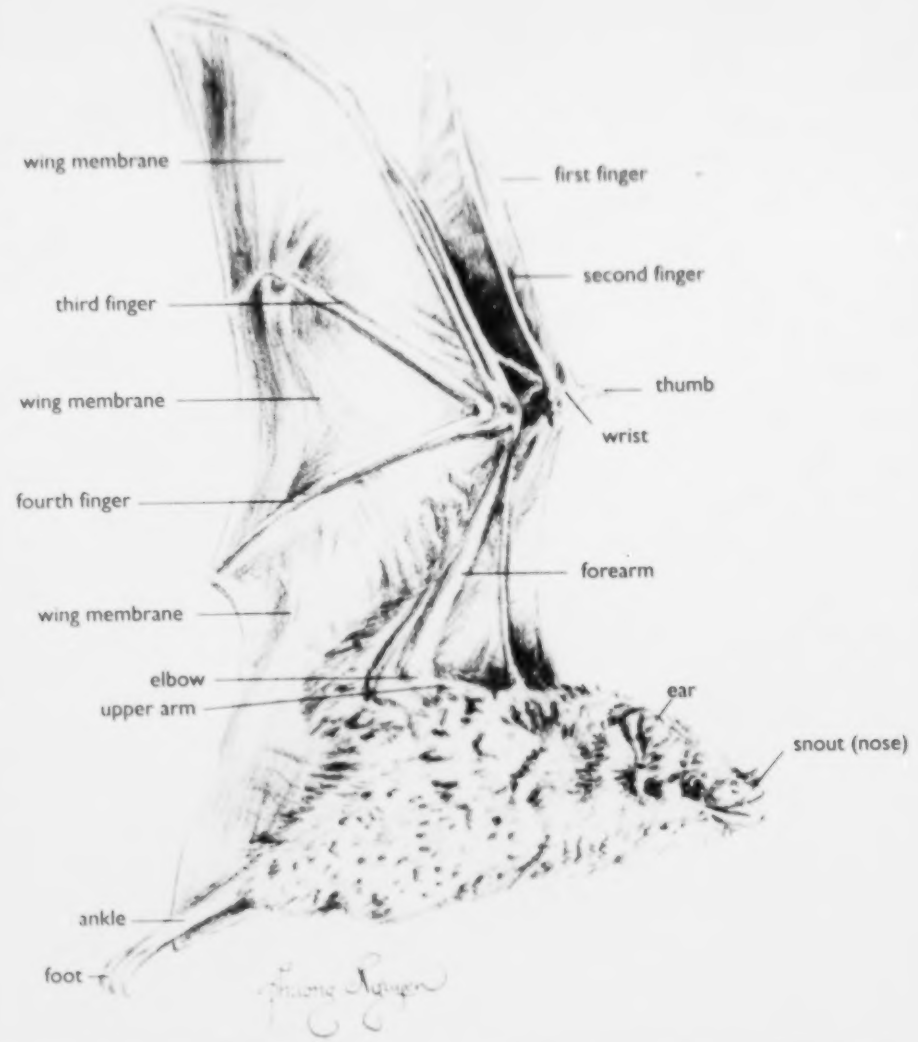
These bats help agave plants reproduce by spreading pollen!

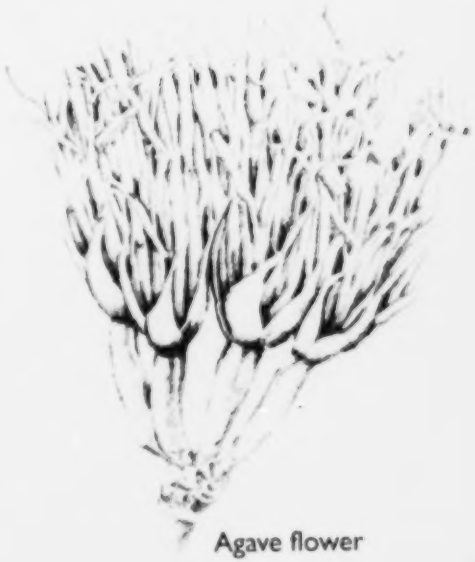
Can you name some other animals that help plants reproduce by spreading pollen?

To view the anatomy of the bat, cut around the dotted lines. Then glue the edges of the two pages together so you can "lift and see" the anatomy of the bat.

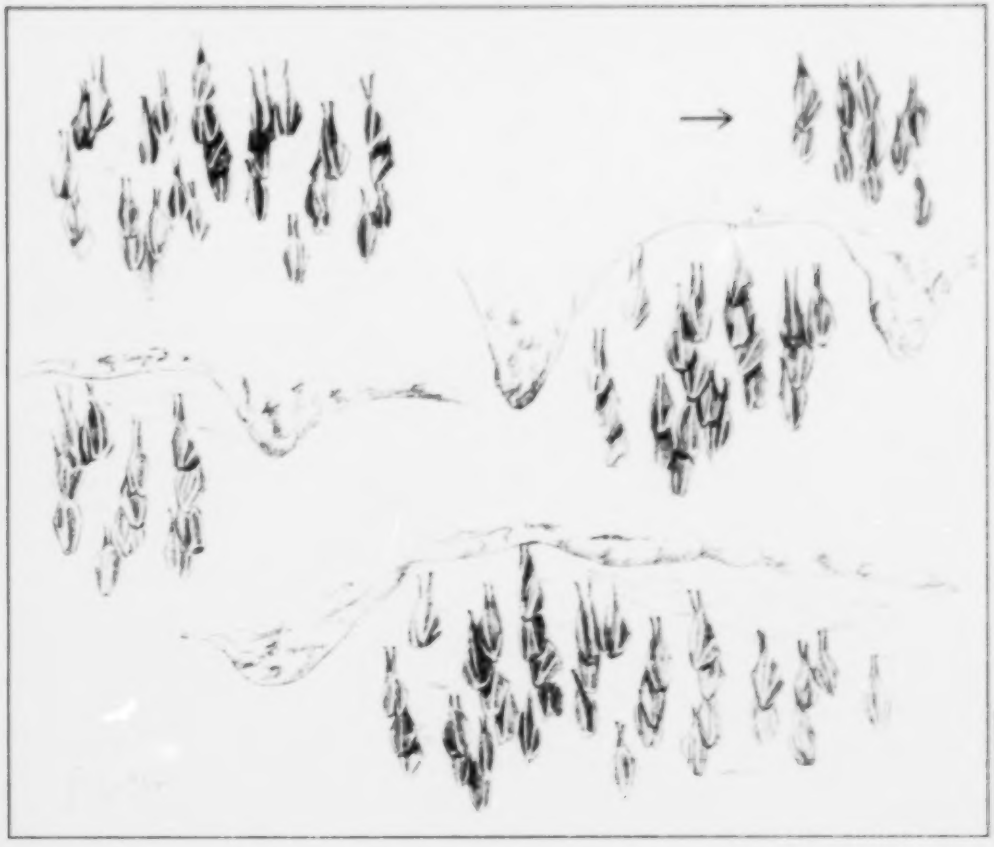
Enjoy looking at the anatomy of the bat!

Glue top pieces across this line.





Agave flower



Map Key

= One Bat

Count the bats in the circle. Then estimate how many you might find in this cave. You have 15 seconds. Time yourself!

How might you make this estimate?

There are about how many bats in this picture?

You will see a bat cave. Follow the map key and the directions to see if you can "be a scientist" and estimate the number of bats in the cave.

Remember, stay in the cave only 15 seconds so you don't disturb the bats. Good Luck!

One way that scientists know whether or not an animal is in trouble is to keep a count of the number of animals in an area or group.

Scientists have a particularly hard time counting bats because they are easily disturbed by noise, movement, and light. If they are disturbed they will take flight! So scientists try to stay only a short time in a cave to count clusters of bats that are roosting.

Therefore, in order to know the number of bats roosting in a cave, scientists use a skill called estimation. (This means making a close guess but the number will not be exact.)

The main reason these two songbirds are endangered is that they have lost their habitat. The growth of cities into the Hill Country, the clearing of tall juniper (also called cedar) and oak forest, and overgrazing by deer and livestock in some areas have made their nesting areas smaller and smaller! This means adults cannot find enough places to nest or food for their young.

For some of the same reasons, the Texas Snowbell is a hill country plant that is also in trouble.

Remember, altering a habitat affects not only animals but plants also.

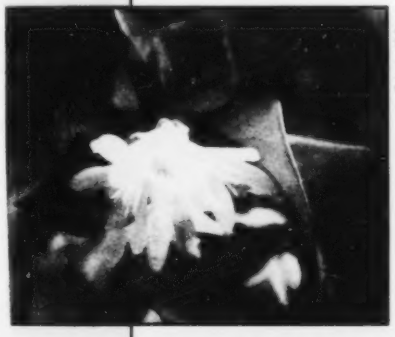
Songbirds of Central Texas

The Golden-cheeked Warbler ...A True Story

© Greg W. Lasley

Golden-cheeked Warblers arrive in the Hill Country in March to nest and raise their young. The juniper/oak woodlands of central Texas are the only areas in the world where these birds nest.

Golden-cheeked Warblers stay in Texas until July or August. Then they migrate (move from one area to another depending on the season) to Mexico and Central America to spend the winter. They return each year to nest in Texas.



© John M. Poole

The Texas Snowbell was listed as endangered in 1987. This plant likes to grow on limestone cliffs among spanish oak, cedar, and Texas ash trees. The flowers are white and grow in clusters among leaves that are very round.

Golden-cheeked Warblers build their nest using strips of juniper bark woven together with spider webs. After the eggs are laid, it takes about 12 days for the young to hatch. The baby birds stay in the nest for about nine days. After they leave the nest, they stay close to the adults. In about four weeks the young birds are feeding themselves and flying well. By August the young are ready for their trip south for the winter.

Can you imagine what a Golden-cheeked Warbler nest would look like? Draw what you imagine! Reread the paragraph to look for the details of how the nest is made.

The Black-capped Vireo ...A True Story

female vireo

male vireo

Black-capped Vireos nest in Texas from April to July. They build a cup-shaped nest in the fork of a branch about 2 to 4 feet above the ground. Three or four eggs are usually laid. They hatch in 14 to 17 days and the chicks are able to fly 10 to 12 days after hatching. Vireo chicks are born with no feathers. Both the parents take on the job of feeding their young. In August, the birds migrate (move to another area) to spend the winter in Mexico.

Black-capped Vireos nest in low level shrubs 2 to 4 feet high (about as tall as your school desk).

Since fires used to keep rangeland open and the shrubs short, the vireos had a place to nest. Now that people have stopped rangeland fires, these shrubs grow thicker and taller. Also, overgrazing by deer and livestock in some places have removed the low-growing nest cover.

Will vireos nest in areas without low-growing shrubs?

No, they've lost their nesting habitat.

There is a type of bird that, in the old days, used to follow the bison herds as they moved from place to place on the prairie. Today, the Brown-headed Cowbird is often found in areas grazed by livestock. There are cowbirds throughout Texas, including the Hill Country, and they create a problem for the Black-capped Vireo.

Female cowbirds lay their eggs in nests built by other birds. (This is called nest parasitism.) The cowbird lays her eggs in the vireo's nest and then leaves the vireos to take care of her eggs and young.

The vireo parents are probably too small to remove the cowbird eggs from their nest. So the vireos are left to take care of all the eggs and young in a nest that is too small.

The problem occurs when the bigger cowbird chicks hatch first, crush the vireo eggs or chicks, or receive all the food. Sometimes vireo parents leave the nest and don't come back. Vireo nests with cowbird eggs don't produce vireo chicks.

What do you think of this story?

Male cowbirds are black with a brown head.

Golden-cheeked Warbler

Color by Number

1. yellow or gold
2. black
3. white
4. grayish green

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Black-capped Vireo

Color by Number

1. black
2. greenish brown
3. dark gray
4. white

55

The Jewel of
South Texas

The Ocelot is one of the most beautiful cats in Texas! He is in trouble! The thick brush that the Ocelot needs for survival has been cleared for farmland and cities.

The Ocelot
...A True Story

Very little is known about the Ocelot because it is so rare and likes to hide in the low, thick brush. They are not often seen. Since Ocelots are so difficult to observe in the wild, scientists attach to the cats collars that emit sounds. These sounds can be heard with special equipment. They also use night vision cameras to take pictures of Ocelots moving around in the dark.

The Ocelot population in Texas is very small; possibly no more than 80 to 120 cats. The Ocelot needs large areas of thick brush habitat for long term survival. The cat blends into the brush by having a spotted coat that looks like the different shades of brown in the thick shrubs.

Most of the thick brush has been cleared away for growing crops and developing cities. Now the brush exists only in small, scattered clumps.

That is why it is so important to connect tracts of land, with long hallway-like strips of habitat. This permits the Ocelot to travel from one area of thick brush to another without having to cross dangerous highways or large areas without brush cover.

This is a map of an area in south Texas where some brush has been cleared and some has been left. Draw in a brush strip to connect the three habitat areas.

Draw a poster to advertise that this is "Ocelot Country." Make it clear to travelers that they need to watch for Ocelots crossing the highways. Be sure to let the reader know that Ocelots prefer areas of low dense brush.

Show your ideas on how Texans can conserve or create Ocelot habitat.

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Get an encyclopedia or another science book to look up the answers to these questions. You might want to check your school library.

1. Bobcats and Ocelots look very similar. Many people and even scientists can mistake them when the animals are far away. There are two parts of their bodies that make them different. Can you identify these two parts?

2. Are Bobcats endangered in Texas?

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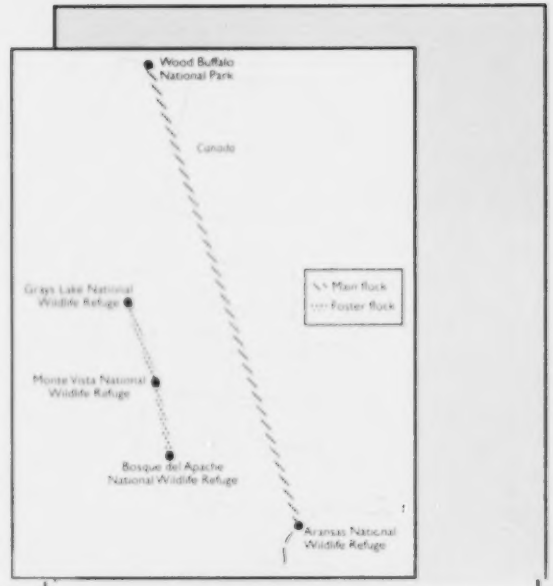
Draw an Ocelot

Color cues: The upper parts of the Ocelot are gray or beige with dark brown or black spots. The underparts are white with black spots. This cat's long tail has dark rings. The backs of the rounded ears are black with one central white spot.

Draw a Bobcat

The Whooping Crane ...A True Story

Whooping Cranes travel 2,500 miles twice a year to and from their nesting grounds in northern Canada and their wintering grounds in Texas. In the northern U.S., where Whooping Cranes used to nest, marshes have been drained for crop production. Also, Whooping Cranes are extremely sensitive to human disturbance on the wintering grounds. Collisions with power lines and fences, along with shootings, have threatened safe migration.



Wildlife officials decided to use Sandhill Cranes (a close relative) to act as foster parents. These foster parents hatched and raised four Whooper chicks in 1975. The Sandhill Cranes then led the Whoopers on an 850-mile migration. (A shorter and less difficult trip than the Aransas-Canada migration route.) Unfortunately, the Sandhill Cranes couldn't teach the Whooping Cranes how to breed properly, and now the foster Whooper flock numbers less than 10. Scientists now believe Whooping Crane parents are better for Whooping Crane chicks.

Another way to improve Whooper numbers is by raising a "captive flock" (a flock of birds held in captivity to produce eggs).

Wildlife scientists have removed extra eggs for incubation (warming eggs so they will hatch) in a laboratory setting. This way most of the Whooper eggs in a nest will produce young. People in costumes that look like Whooping Cranes teach the chicks how to eat and survive. The young birds are released back into the wild.

Since 1993, Whooping Cranes raised in captivity have been released into the wet prairies of central Florida. This flock (which does not migrate) now numbers 15 birds.

A Whooping Crane chick is cinnamon in color.

The rare Whooping Crane is another victim of habitat loss.

Whooping Cranes have been on the endangered species list since 1973.

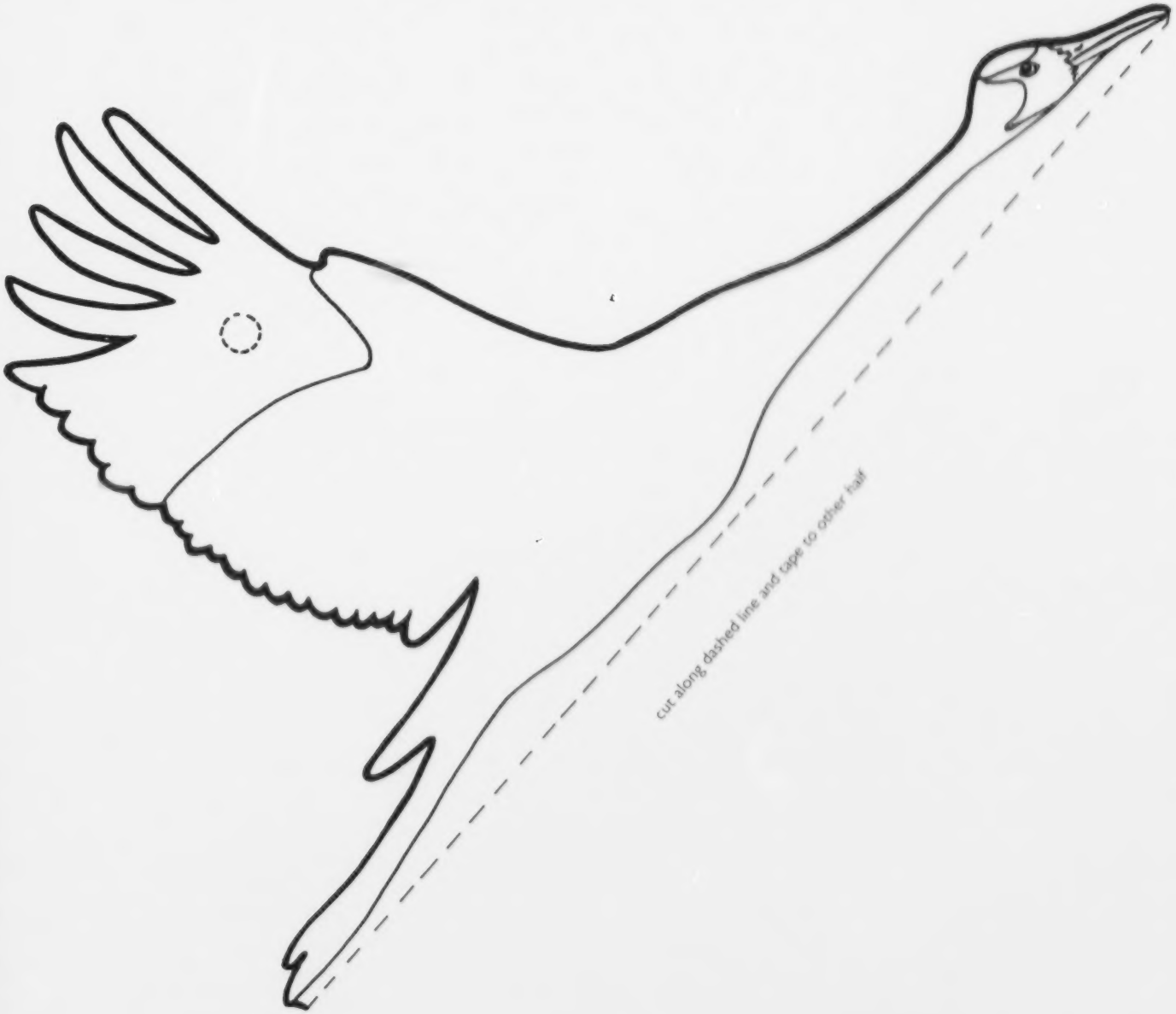
Due to conservation efforts, Whoopers have grown in number from only 14 in 1938 to over 160 wild birds in 1995. A great success story!

Can you find the picture of the Whooping Crane using the clues from Whooper Trivia? Circle it!

Whooper Trivia

- The tallest bird in North America
- Mates for life
- They usually lay two eggs, one of which will most likely be successfully raised
- Named for its call — a loud trumpeting "whoop"
- Eat crabs which are swallowed whole
- Their feet are the size of a human hand

There are a number of birds that may appear similar to the Whooping Crane in flight. This similarity and the fact that the Whooping Crane is large and easily spotted are reasons for mistaken shootings. Remember, the Whooping Crane is seen in small flocks of two to fifteen.



Making a Crane mobile.

Color, cut and tape the Whooping Crane together. The wings are designed for hanging the Whooping Crane in flight.

Color cues: Adult birds are white with red on the top of the head and black under the eye. When in flight, the Whooper's black-tipped wing feathers can be seen and their long legs extend beyond the tail feathers. The beak is long, straight and greenish gray. The eyes are yellow. Whooping Crane chicks are a reddish brown color.

cut along dashed line and tape to other half

cut along dashed line and tape to other half

Complete these tables!

A scientist takes one egg from a Whooping Crane nest and leaves one to be raised by the parents. This insures that half the eggs produce young Whoopers in protective captivity.

For every 10 crane eggs laid, how many would have been taken out by scientists and raised in captivity?

Complete the chart to find your answer.

Wild Flock Cranes	2	4	6	8	10
Scientists Raising Eggs in Captivity	1	2			

There are 5 wild groups of cranes migrating from the Texas coast to Canada. Each flock has 12 birds in it.

How many might arrive in Canada if none are shot, hurt by power lines, or die in some other way?

Group	1	2	3	4	5
Cranes Arriving	12	24			

The Houston Toad and the Large-fruited Sand Verbena ...A True Story

The Houston Toad is an endangered amphibian. Houston Toads are known to exist in only nine Texas counties. The toads occur only in areas of deep sandy soil within these counties. The largest known population of Houston Toads exists in and near Bastrop State Park.

Because Houston Toads are poor burrowers, they need loose sandy soils so they can dig down and cover themselves with soil. By burrowing into the sandy soil, they are protected from cold winters and hot dry summers.

The Houston Toad will travel long distances to find water for breeding and egg laying. Sometimes the toads cross busy roads and are killed.

City expansion has caused many habitat changes. Wetlands may be drained or temporary ponds made into permanent ponds or lakes. The permanent water attracts predators such as snakes and fish.

Recent studies show that bites from fire ants can be a major cause of death for young toadlets moving out of the breeding pond. The use of pesticides and similar chemicals may also contribute to the decline of toad populations.

Large-fruited Sand Verbena flowers are pink-purple.

Both the Houston Toad and the Large-fruited Sand Verbena live in areas of natural vegetation with sandy soils.

Habitat loss is the main reason for the decline of the Houston Toad. Areas of sandy soil with natural vegetation have been replaced by cities or planted to pastures. The grasses in planted pastures often grow too thick for the toad to move through.

Also, many of the small shallow ponds that the toads use to lay their eggs have been drained or changed so that they no longer provide good breeding sites.

Toad Trivia

Males gather in small groups around temporary bodies of water, such as rainpools. Their unique mating call is a high pitched trill lasting up to 15 seconds.

The females are attracted to this call. Females lay their eggs in long strings in the water. Some females produce as many as 6,000 eggs at a time, but most produce 1,000 to 2,000 eggs. The eggs hatch within seven days, and the tadpoles change into toadlets (metamorphosis) in 15-100 days. Then the little toadlets leave the pond to begin their life on land.

THE HOUSTON TOAD

Part 1

"Spin a Stage"

Cut out the circle, then cut along the dotted line to create a view space. Color the stages of toad development on Part 2, and use a brad to connect it to Part 1.

Spin to view the stages of a toad's metamorphosis.

Color cues: Toads have a spotty pattern of dark brown, gray, green, and yellow. Tadpoles are dark brown or black. Eggs are like clear jelly with a dark spot (the embryo) in the middle.

Part 2

Cut out the circle and attach it to Part 1 with a brad. Spin the circle to view the stages of the toad's development.

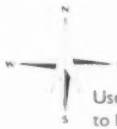
Challenge Activity

Situation:

Your family has just bought some land in Houston Toad habitat and wants to build a new house. Using the space below, draw a "birds eye view" map of your house, yard and land. Follow the directions at the bottom so you can help protect the Houston Toad.

Directions:

1. Draw a small breeding pond in the southeast corner of the property.
2. Draw a road in the northwest corner.
3. Draw a stream running along the south edge of the property.
4. The eastern half of the property has deep sandy soils with scattered oak trees and shrubs. This is Houston Toad habitat. Draw it on the map.
5. Draw your house in an area that is not Houston Toad habitat.
6. Use native plants to landscape your house and yard.
7. Keep native plants along streams and near breeding ponds.



Use this compass to help you draw your map.

From what you already know, list as many differences as you can between a frog and a toad.

NOW! Go to the encyclopedia or other reference book and see if the differences you listed are correct. Add any differences you read about that were not on your original list.

What do the Houston Toad and the Large-fruited Sand Verbena have in common?

Note to Teachers and Parents

This activity book was developed to provide information and foster an appreciation for the native plants and animals of Texas, particularly those species that have declined in number due to human impacts. The activities were designed to help students acquire basic knowledge concerning the interdependency of plants, animals and people. Responsible citizenship, cause/effect relationships, and conflict resolution are significant themes in the activity book. A primary goal was to design activities that integrate science, social studies, language arts and math concepts.

Although this activity book was developed primarily for use by individual students working alone or with a parent, the book is flexible enough to be used as a teaching base for content curriculum in grades three through five. Teachers may wish to modify the activities or change the organization of the material based on the instructional delivery used.

A number of Texas Essential Elements are addressed in the activity book. These include:

Science
- Explore the environment
- Describe changes that occur to objects and organisms in the environment
- Identify cause and effect relationships
- State similarities and differences

Social Studies
- Accept consequences for one's decisions
- Identify ways behavior could be changed to solve a particular environmental problem
- Identify rights and duties of citizens in their environment
- Map interpretation

Language Arts
- Use specialized and technical content area vocabulary
- Acquire reading vocabulary related to concepts being learned
- Engage in creative dramatic activities
- Retell a story
- Follow written directions

Math
- Experience number concepts using tangible models or non-standard familiar units of measure
- Estimation
- Graphing

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